The Office Action stated that, as per claim 17, Koenck teach a hand-held optically readable information set reader having one or more photosensor arrays (see abstract), and imaging array, an optical axis, and a lens system (see figure 32). *The Office Action admits that Koenck does not specifically teach a lens system having a characteristic distortion of an image and an array having a shape to achieve compensation.* However, the Office Action maintains that those are inherent features for photosensor arrays having a lens system; the shape of the array has no significant purpose with how this device operates; and the reason why they combine these two elements together are to not only have an automatic control of the lens system but also a better image would be displayed when looking at a distance.

Applicant respectfully, but strongly, traverses. Applicant respectfully submits that the Office Action has failed to make a prima facie showing of obviousness. Moreover, Applicant submits that the Office Action has mischaracterized Koenck and the teaching which it makes thereby failing to make a prima facie showing of inherency.

Claims 17 sets forth "a lens system for providing a focus for imaging by said array", the lens system having the feature that "said lens system having a characteristic of introducing curvilinear distortion of an image to said array the limitation". Claim 17 further sets forth a feature that " said array having a shape to achieve compensation of said curvilinear distortion, including having arcuate edges to establish said compensation". *The Office Action has admitted that Koenck does not specifically teach a lens system having a characteristic distortion of an image and an array having a shape to achieve compensation.*

Contrary to the assertions of the Office Action, Applicant respectfully submits that the feature of claim 17 of "said array having a shape to achieve compensation of said curvilinear distortion, including having arcuate edges to establish said

compensation" is not inherent in the teaching of Koenck. MPEP §2112 and the case law require that an examiner must provide rationale or evidence tending to show inherency. "In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the alleged characteristic necessarily flows from the teachings of the applied prior art," *Ex parte Levy*, 17 USPQ2d, 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original). Figure 31 of Koenck clearly shows an array of rectangular photosensors in a rectangular array. Moreover, Koenck teaches away from the use of an arcuate edged-shaped array of photosensors to compensate for image distortion. Koenck teaches initial processing of the captured image during a normalization or calibration process in which blemishes in the image are recognized and the image is blemish neutyralized in accordance with known data processing techniques (see e.g., Col. 36, li. 53-56)..

Contrary to the assertions of the Office Action, Applicant maintains that the specification of the instant application sets forth many reasons why the particular configuration of the array having acruate edges is significant and is more than simply one of numerous configurations a person of ordinary skill in the art would find obvious for the purpose of having different types of edges. For example, at page 25, beginning at line 2, Applicant states that because of this configuration although the images of the feature are still distorted, the distortion causes the images to fit with-in the pixels. Thus, each feature will be viewed as being rectilinear at the computation array level. . . . This process produces accurate imaging with lenses of any field of view, and has many applications such as in positional navigation. However, in the present pointing device, it is a goal to transduce angles and not distances. For lenses of narrow fields of view, angles tend to become increasingly compressed as one moves further off of the optical axis. This undesirable angular compression is avoided by changing the design process such that a segment of a sphere is substituted for the aforementioned flat array.

Applicant then summarizes several advantages on page 26 beginning at line 2. One advantage of the curvilinear array is that it provides more accurate autocorrelations, regardless of how far the images move from the axis of the sensor array. A second benefit is that distances are true and not compressed, so that attitude tracking is accurate over larger pixel moves without regard to where the move is imaged on the sensor array. Each benefit of the curvilinear array in itself contributes to more accurate tracking. Since the correlation is stronger and less noisy, the accuracy of measuring the end point of each move segment is higher. Moreover, since the image can be tracked in longer segments, the frequency of zeroing the reference frame is reduced, so that the cumulative re-zeroing error becomes less. Finally, because the curvilinear array does not compress off-axis moves, the accuracy of distance measurement is greater.

Regarding Koenck, there is nothing to show that the 2-dimensional array of Figure 31 (or, for that matter, Figure 45, etc.) is anything but a conventional rectilinear array. At column 6, line 12-13, the system of Figure 31 is described as having a typical solid state video imaging array and lens system and the dimensions shown in Figure 31 show a conventional rectilinear sensor array. Although most of the description of Figures 31 and 32 is incorporated by reference from US patent 5,019,699, the description beginning with Figure is similar to that for Figures 31 and 32. In no place does Koenck recognize lens introduced distortion as being a problem (or even existing, for that matter). Although Koenck discusses many possible causes of imaging artifacts, Koenck teaches, for example at page 37, line 31-44, a digital processor that performs post processing of a raw image to remove blemish and noise components, rotate the image to a normalized position, correct for optical skew due to curvature of the target label or reading form an off-axis angle, and the like.

Furthermore, at column 40, lines 13-27, Koenck teaches the use of a Xenon flash to adjust the "f-stop" of the optics and thereby focus an image on the sensor

array even though the distance may vary between two inches and well in excess of one foot. If further range is required, Koenck teaches the automatic focusing techniques to further increase the ability of the reader to focus over an increased range of several feet.

The Office Action stated that, as per claims 18 and 19, Koenck teach photosensors that are disposed in columns and rows; that Figure 32 clearly shows the optical axis for the array; and that having the columns spaced apart by an arcuate boundary with radii increasing with departure of curvature is inherent.

Applicant respectfully disagrees. Figure 32 of Koenck '978 is a simplified version of Figure 2 of the Koenck '699 patent, which was incorporated by reference into the '978 patent ('978, col. 6, li. 11-26). In the description of figure 2, Koenck teaches that the imaging array may be placed directly in line with the optical axis of the reader ('699, col. 3, li. 7-11). Thus, the optical axis shown by Koenck is that of the reader instead of that of the imaging array.

Moreover, Figure 31 of Koenck '978 and Figure 1 of Koenck '699 clearly teach a rectangular imaging array having rectangular pixels. For example, in Figure 31 it is clearly shown that the array is rectangular and made up of rectangular pixels. Within the accuracy of the dimensions given for an individual pixel, multiplying the width of a pixel times the number of pixels in a row yields the given width of the array. Similarly, multiplying the height of a pixel times the number of pixels in a column yields the height of the array. Clearly, Koenck teaches a rectilinear array which does not have arcuate boundaries which increase with the radii. There is simply nothing in either Koenck patent to suggest that having the columns spaced apart by an arcuate boundary with radii increasing with departure of curvature is inherent in the array or even a desirable property of an imaging array.

rectilinear

Therefore, for the reasons above, Applicant maintains that claims 18 and 19 are allowable.

The Applicant respectfully suggests that each of the claims presently in the application is patentably distinct over the prior art and that the application is now in condition for allowance. Accordingly, the Applicant requests that the rejection of the claims be withdrawn and the claims allowed. A notice of allowance is earnestly solicited.

Respectfully submitted,
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